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Executive Office of Energy & Environmental Affairs

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Massachusetts Greenhouse Gas Reporting Program: 2014 Verification Review

September, 2015

Table of Contents

Introduction

The Massachusetts greenhouse gas reporting regulation, at 310 CMR 7.71(7)(h), states:

> ***Not later than December 31, 2014, the Department [of Environmental Protection] shall complete a review, including an opportunity for public comment, of the verification requirement established pursuant to 310 CMR 7.71(7). This review shall evaluate the***

costs of verification to facilities, the quality and uses of the data in the registry, and any other information relevant to determining whether the verification requirement should be amended.

To conduct this review, the Massachusetts Department of Environmental Protection (MassDEP) has (1) administered a survey to the reporting facilities to gather information about verification costs and impacts, (2) analyzed the reported data to determine the impacts of verification, and (3) evaluated the uses of reported data. MassDEP seeks public comment on this draft verification review document. The document includes background information on the verification requirement, three sections that address the review criteria listed above, and a concluding section that includes a discussion of key considerations and a description of the recommended approach to amending the verification requirement.

Comments on this draft review document may be submitted by email to climate.strategies@state.ma.us until October 9, 2015. After considering comments, MassDEP intends to propose revisions to 310 CMR 7.71. The public comment period on that proposal will provide an additional opportunity to comment on specific changes to the regulation.

Background

The Massachusetts greenhouse gas (GHG) reporting regulation, 310 CMR 7.71, requires annual reporting of GHG emissions by approximately 300 of the largest stationary GHG emission sources in the state whose emissions exceed 5,000 short tons CO_2e per year and, in order to ensure data quality, triennial verification of facility reports by a third-party verification body.[1] This regulation is based on language in the 2008 Massachusetts Global Warming Solutions Act (GWSA) stating that MassDEP must "adopt regulations to require the reporting and verification of statewide GHG emissions."[2] To meet the verification requirement, facilities must hire an accredited third-party verification body to verify their GHG emissions report once every three years. 2013 marked the completion of the first round of verification for all facilities.

The Technical Support Document published when the GHG reporting regulations were proposed in 2009[3] laid out three potential approaches to verification:

[1] 310 CMR 7.71 also includes a requirement for retail sellers of electricity to report certain GHG-related information annually. This requirement is not discussed in this document because there is no general requirement for retail sellers to verify reported information pursuant to 310 CMR 7.71(7), and because no retail seller has chosen to complete an optional facility-specific submittal that would trigger the verification requirement.
[2] See M.G.L. Chapter 21N, Section 2(a)
[3] Note this report refers to two Technical Support Documents (TSD): The 2008 TSD accompanied the emergency GHG reporting regulation promulgated in 2008 to meet the GWSA statutory deadline, and the 2009 TSD accompanied the 2009 GHG reporting regulation amendments which established the third-party verification requirement.

1. Third-party verification similar to that used for The Climate Registry's (TCR) voluntary reporting program, based on the General Verification Protocol.[4] This requires that each facility hire an accredited, TCR-approved, third-party verification body to conduct a risk-based verification in which reports must be found greater than 95% accurate to receive verification.
2. Self-certification similar to that used by the MassDEP Source Registration program (310 CMR 7.12), in which facilities must certify that their reported emissions are "true, accurate, and complete" under penalty of perjury. Self-certification would be subject to potential MassDEP audits.
3. Verification exemptions for specific source types, such as those reported to the US Environmental Protection Agency (EPA) under the Continuous Emissions Monitoring Rule (40 CFR Part 75) and the Regional Greenhouse Gas Initiative (RGGI) offset program.[5]

In the Technical Support Document, MassDEP stated that third-party verification of reported GHG emissions was necessary in order to:

- Provide the most accurate and complete data possible for emissions inventory and planning processes
- Ensure consistency with other GHG reporting programs, such as TCR and WCI [Western Climate Initiative[6]]
- Improve the credibility of GHG programs, such as early reduction credit programs, that may be implemented in the future under GWSA
- Build confidence in any market-based system that extends beyond the already well-monitored electricity generators that are included in RGGI
- Demonstrate a commitment to addressing climate change to the public and stakeholders
- Provide better consistency of reporting across all facilities.

After considering comments submitted during the public comment period, MassDEP finalized the verification requirement as a hybrid of approaches number one and three above, including triennial third-party verification based on the General Verification Protocol, with an exemption for sources reporting CO_2 emissions under 40 CFR Part 75. Requiring verification every three years, as opposed to every two or five years, was chosen to balance the need for high quality data with the burden on facilities, and also because the GWSA requires the triennial publication of a state GHG emissions inventory. Facilities were broken into three groups according to the amount

[4] See http://www.theclimateregistry.org/resources/verification/general-verification-protocol/
[5] See 310 CMR 7.70(10) or corresponding provisions in the CO_2 Budget Trading Program regulations of any other state.
[6] See http://www.wci-inc.org/

of their reported GHG emissions: a) facilities reporting greater than 25,000 short tons per year of CO_2 in emissions year (EY) 2009, b) facilities not previously verified reporting greater than 10,000 short tons per year of CO_2e in EY 2010, and c) all other facilities reporting greater than 5,000 short tons per year of CO_2e.

Some stakeholder responses to the verification proposal cited concerns about costs and availability of verification bodies, while others said that self-certification would be "risky in terms of data quality." In response to the broad concerns about the third-party verification requirement, MassDEP added the requirement to review the verification process, after it had been fully implemented for all facility groups.

Additional information about the verification process, including a list of recognized verification bodies and a verification checklist that lists the steps in the verification process, is available on MassDEP's website.[7] General information about MassDEP's GHG reporting program, including a link to the MA GHG Registry ("the registry"), is available at the same web address. The registry is the electronic reporting system used to support the GHG reporting and verification processes. The text of 310 CMR 7.71(7), which includes the regulatory requirements related to verification, is included in Appendix 1 of this document.

Cost of Verification

In the 2009 GHG reporting Technical Support Document, MassDEP cited TCR's Sample Verification Costs document, which estimates third-party verification costs for a single facility ranging from $500 to $17,000. To gain a better understanding of the actual cost of verification to MA facilities, MassDEP administered an online survey to its approximately 300 facilities in March 2014. The survey asked facilities to identify the year of verification, GHG emissions reported in that year, and the approximate cost of verification (i.e., $0-2,500; $2,501-5,000; etc.). The survey also asked facilities to indicate whether verification led to changes in their reports and/or their reporting practices and whether the potential improvement in data quality was worth the cost to the facility. See Appendix 2 for the full survey and detailed results. A summary of the results follows.

A total of 69 facilities, or about one-quarter of all of the facilities which report to the registry, completed the survey. MassDEP notes that the survey results may be influenced by self-selection bias by those facilities which chose to respond, as data was not collected using random or statistical sampling techniques. In particular, it is possible that facilities with higher costs of verification may have been more likely to complete the survey to communicate the impact of these costs. That said, the respondents were evenly split among the three reporting years which were verified (2010, 2011, and 2012), suggesting that a reasonable cross-section of facilities

[7] See http://www.mass.gov/dep/ghgreporting.

responded. Reported emissions show a clear decline over the three years, since larger facilities were required to verify first (see Figure 1).

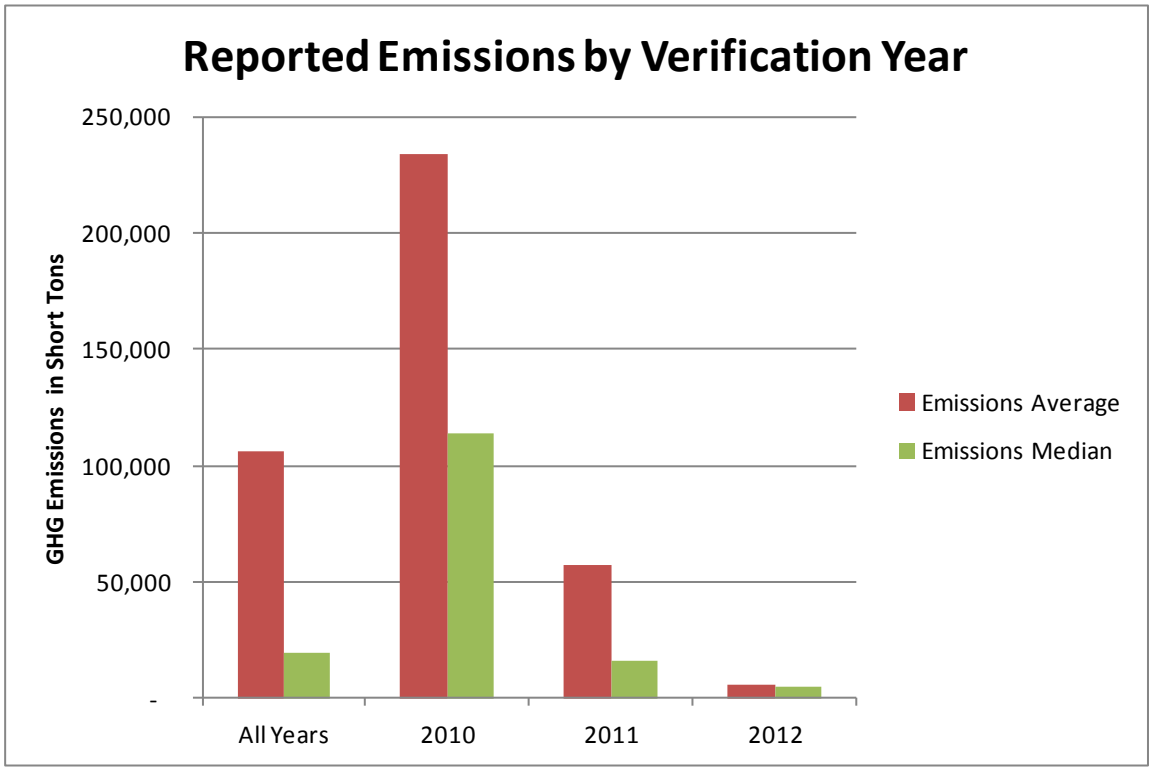

Figure 1: When sorted by verification year, the reported emissions of survey respondents show a consistent downward trend from 2010 to 2012. This corresponds to the verification schedule, which is based on emissions quantity, and may also relate to the size and/or complexity of operations at the facility. This in turn could affect the cost of verification. Median emissions are indicated to offset the effect of individual facilities with very high or low emissions which disproportionately affect the average.

Facilities were asked to report how their verification costs (the amount paid to the verification body) fell into one of six cost categories: $0-2,500; $2,501-5,000; $5,001-10,000; $10,001-15,000; $15,001-25,000; and greater than $25,000. As illustrated in Figure 2 below, the majority of facilities paid between $2,501 and $10,000 for verification, with 50% falling into the $5,001-10,000 category. This fits well within the range identified by TCR's Sample Verification Costs document. Year-to-year trends are somewhat mixed. Facilities verifying EY 2012 data clearly spent less than facilities verifying EY 2010 or EY 2011, with 53% in the $2,500-5,000 category and only 8% above $10,000. This seems to correspond to the smaller facility size for EY 2012, though could also have been influenced by the verification bodies gaining additional years of experience and ability to streamline the verification process. Comparison of facilities verifying EY 2011 to EY 2010 is less clear; while EY2011 facilities have fewer emissions, their verification costs seem to be higher, with 33% falling into the $15,001-25,000 category. It is possible that verification of these facilities is more complicated due to multiple emission sources

which may not be otherwise monitored; the EY 2010 facilities more likely exceed the 25,000 metric ton threshold for EPA's GHG reporting rule, so they might have more experience monitoring and reporting their emissions to meet federal requirements or have emissions which are monitored under 40 CFR Part 98 and therefore not subject to verification.

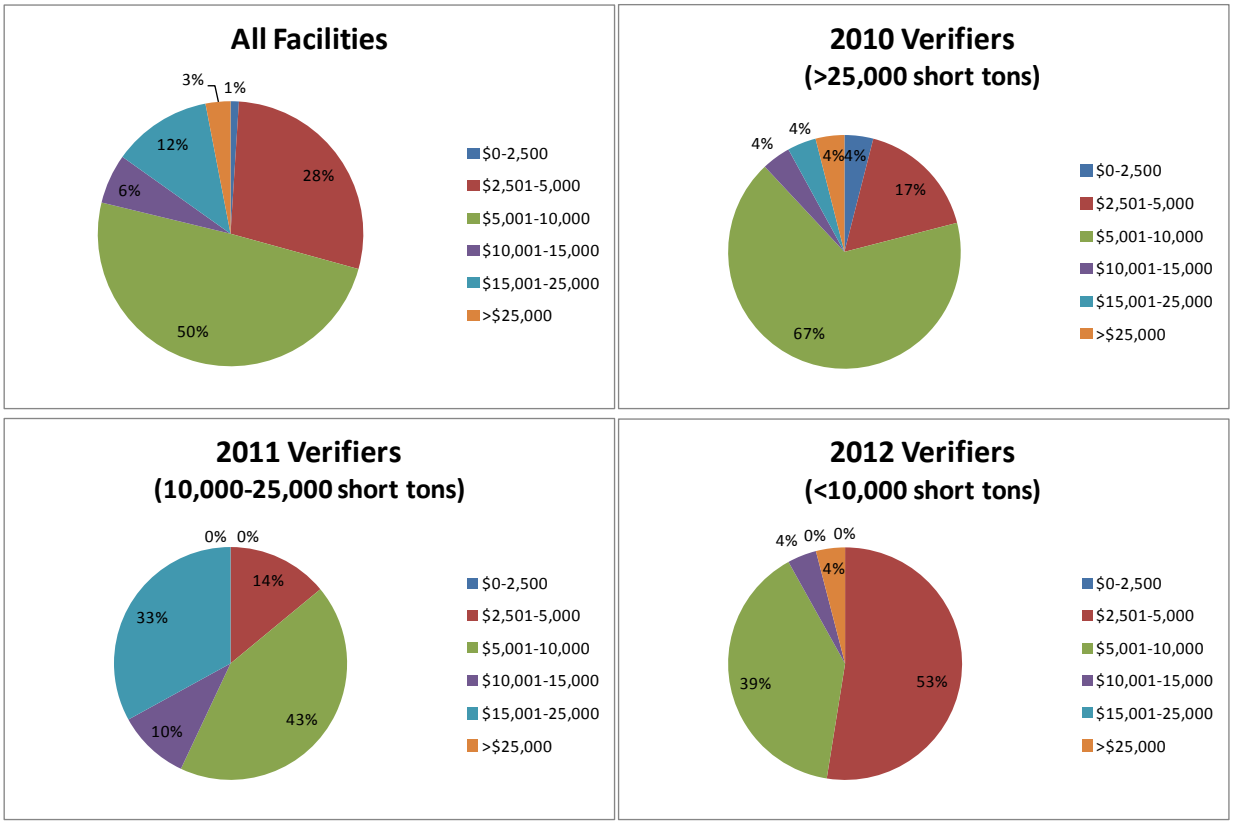

Figure 2: Distribution of survey responses in each verification cost category, aggregated ("All Facilities") and then divided by verification year. "All Facilities" includes the 69 total respondents; EY 2010 includes 23 facilities; EY 2011 includes 22 facilities; and EY 2012 includes 24 facilities.

Quality of Data in the Registry

The verification process is one of three steps to ensure the quality of the GHG data in the registry. First, each report is certified by the facility's Responsible Official using a form provided by the Department, including submitting a statement that "I certify that I have personally examined the greenhouse gas emissions report for this facility and am familiar with the information contained in that report and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment" and including the authorized signature and contact information of a responsible official of the reporting entity (see 310 CMR 7.71(6)(a)). Certified reports are then reviewed by MassDEP for consistency with prior year

reports (when available) before being accepted and published in the registry. The triennial verification requirement provides a further check on the accuracy of the reports by providing an in-depth, risk-based analysis of the reporting methods and data.

Surveyed facilities were also asked about the impact of verification on their emissions data. According to their responses, the verification process had a limited impact on their reported emissions. While almost half made some changes to their emission reports due to verification, of those who made changes only 12% made changes of 5% or greater, the threshold for materiality in the verification process (note this rate was significantly higher for facilities which verified EY 2011, and lower for those verifying EY 2010 and 2012[8]). This proportion is significantly lower than that found through direct analysis of the data described below. Very few facilities reported changes to prior year reports due to verification, while about 40% said verification led them to change future methodologies. Many of these changes were reported to be to minor emission sources. Overall, about one-quarter of survey respondents said that verification improved the quality of their data, while less than 20% said that the process was worth its cost. Those responding positively stated that it was helpful to ensure they were reporting using the proper methods and that their numbers were correct, especially for their first time reporting. Those responding negatively indicated that they were already comfortable with the reporting methodology and that verification is redundant to their internal certification as well as verification for other reporting programs such as EPA's. They indicate that the cost is not worth the small resulting changes in emissions, particularly when staff time—which was not included in the survey cost categories—is factored in. While a few facilities criticized the verification bodies for inefficiency or lack of familiarity with the reporting process, most praised the verification bodies as effective and good to work with, though not necessarily worth the cost.

MassDEP analyzed the impact of verification on the quality of data contained in the registry by comparing the data in the registry each year before and after verification. Pre-verification data was drawn from a summary report downloaded in late July following the reporting year, and post-verification data from a summary report downloaded in March following the December 31st verification deadline.[9] Data was analyzed for the three verification groups: a) facilities reporting greater than 25,000 short tons per year of CO_2 in 2009, which were required to verify EY 2010 reports, b) facilities not previously verified reporting greater than 10,000 short tons per year of CO_2e in 2010 verifying EY 2011, and c) all other facilities verifying EY 2012. The summary data was analyzed using an Excel spreadsheet to compare the pre- and post-verification

[8] See Appendix 2 for detailed results.

[9] July and March were chosen to capture most changes resulting from verification without capturing other changes, and additional checks were used to identify and isolate changes resulting from verification. However, it is likely that a small number of changes counted in this analysis were not actually the result of verification, and that some verification-related changes that occurred before July or after March are not counted.

emissions reported for each facility by segment, the smallest unit of emissions reported.[10] The spreadsheet then calculated, for each facility, the change in total emissions, and the percentage change. For EY 2011 and 2012, the number of segments added and changed was also analyzed. The results of this analysis are summarized below.

As of March 21, 2014, a total of 266 out of 295 facilities had successfully verified GHG emissions reports. Of these, 168 (63%) made changes to their reports as a result of verification, with 87 (33%) making material changes equal to or greater than 5% of total emissions reported, and 81 (30%) making changes of less than 5% (see Table 1 and Figure 3). Of the facilities that made changes, decreases in reported emissions were almost as common as increases. The list of facilities that have not successfully verified a report includes facilities that are currently working to complete verification, and reports that verification bodies were unable to verify because of missing or poor quality data. Through the enforcement process, MassDEP is requiring these facilities to verify a future year report for which data is available outside of the normal verification schedule.

Table 1: Verification Results by Year	2010	2011	2012	Total
Facilities Required to Complete Verification	64	83	148	295
Total Facilities Verified	64	77	125	266
Verified Facilities with Changes	44	42	82	168
Verified Facilities without Changes	20	35	43	98
Verified Facilities with Changes ≥ 5%	12	29	46	87
Verified Facilities with Changes < 5%	32	13	36	81
Verified Facilities with Positive Changes	30	18	46	94
Verified Facilities with Negative Changes	14	24	36	74
Verified Facilities without Changes ≥ 5%	52	48	79	179

[10] For combustion sources that use multiple fuels, a segment is made up of the combination of one fuel and one GHG. For example, a single boiler burning both gas and oil emits CO_2, CH_4, and NO_x and has a segment for each fuel-gas combination, for a total of 6 segments. For other sources, each segment includes one GHG. Due to database limitations, segment-level analysis was not completed for EY 2010 data.

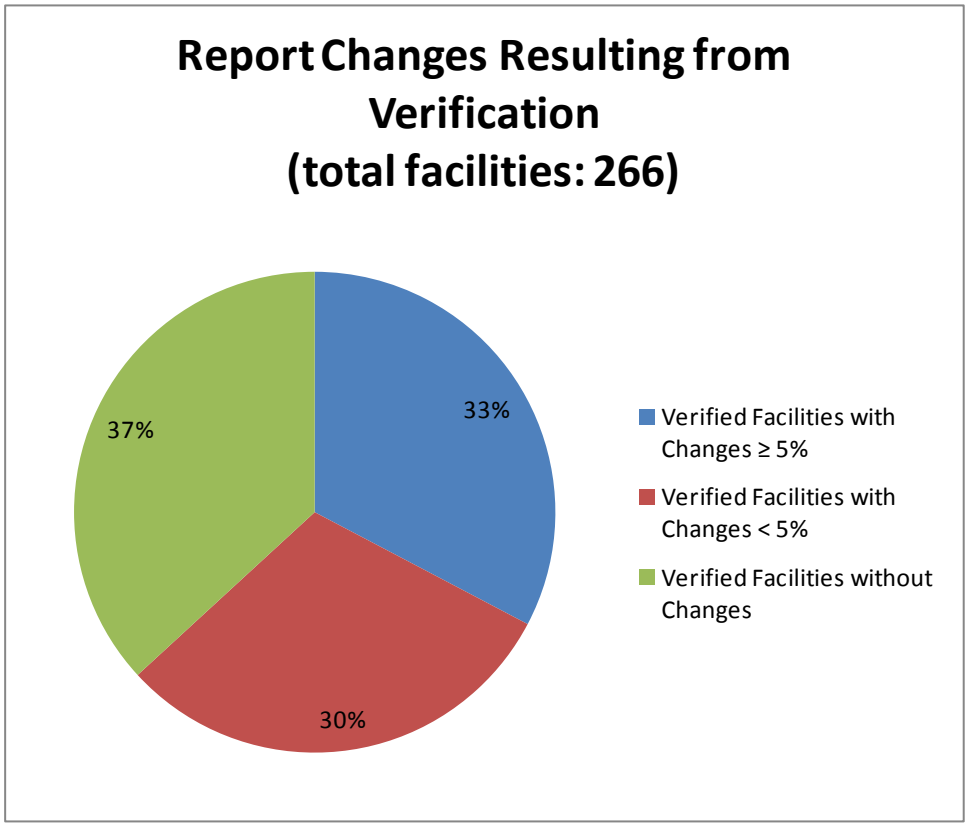

Figure 3: Of the facilities which successfully completed verification, approximately one-third made changes of greater than 5% of their total reported emissions, one-third made changes of less than 5%, and one-third did not make any changes. Note that this includes positive and negative changes.

Based on analysis of changes to the emissions data, the verification requirement led to significant improvements in the data quality. In total, 1,409,115 metric tons CO_2e emissions were changed in reports during the verification process. The average magnitude of changes to reports is 8,289 metric tons CO_2e, and the average percent change is 31% (15% excepting one report which increased by almost 3,000%). 107 facilities had changes of less than 1,000 metric tons CO_2e, while 41 had changes between 1,000 and 5,000 metric tons CO_2e, 22 had changes greater than 5,000 metric tons CO_2e, and 125 facilities had zero change or were not verified (See Figure 4). 56% of the reports had additions, while 44% had subtractions, leading to a net change of -965,493 metric tons CO_2e (see Figure 5). Two facilities had changes of more than 300,000 metric tons CO_2e. If these facilities are removed from the analysis, the net change is reduced to -70,115 metric tons CO_2e (an average magnitude of 3,057 metric tons CO_2e per facility). Note that these observed changes are significantly higher than those reported by the subset of facilities that responded to the verification survey, discussed above. For EY 2011 and 2012, a total of 559 individual segments were added or removed from reports during the verification process, with a net addition of 401 segments (average 3 per facility); 986 segments were changed (average 8 per facility). See Appendix 3 for more detailed data and graphs of the report changes.

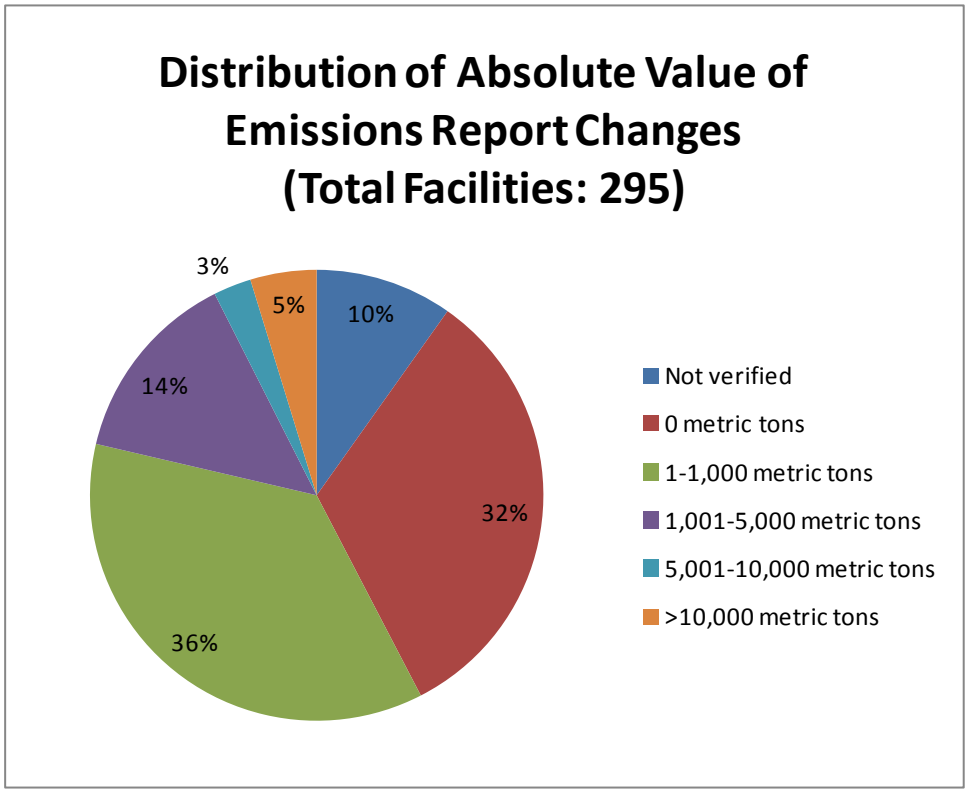

Figure 4: This graph shows the status of all of the facilities reporting to the MA GHG Registry, including 29 that have not yet completed the verification process. Of the reports that changed by more than 10,000 metric tons CO_2e, two changed by more than 300,000 metric tons and three more changed by more than 50,000 metric tons. Note that this includes positive and negative changes.

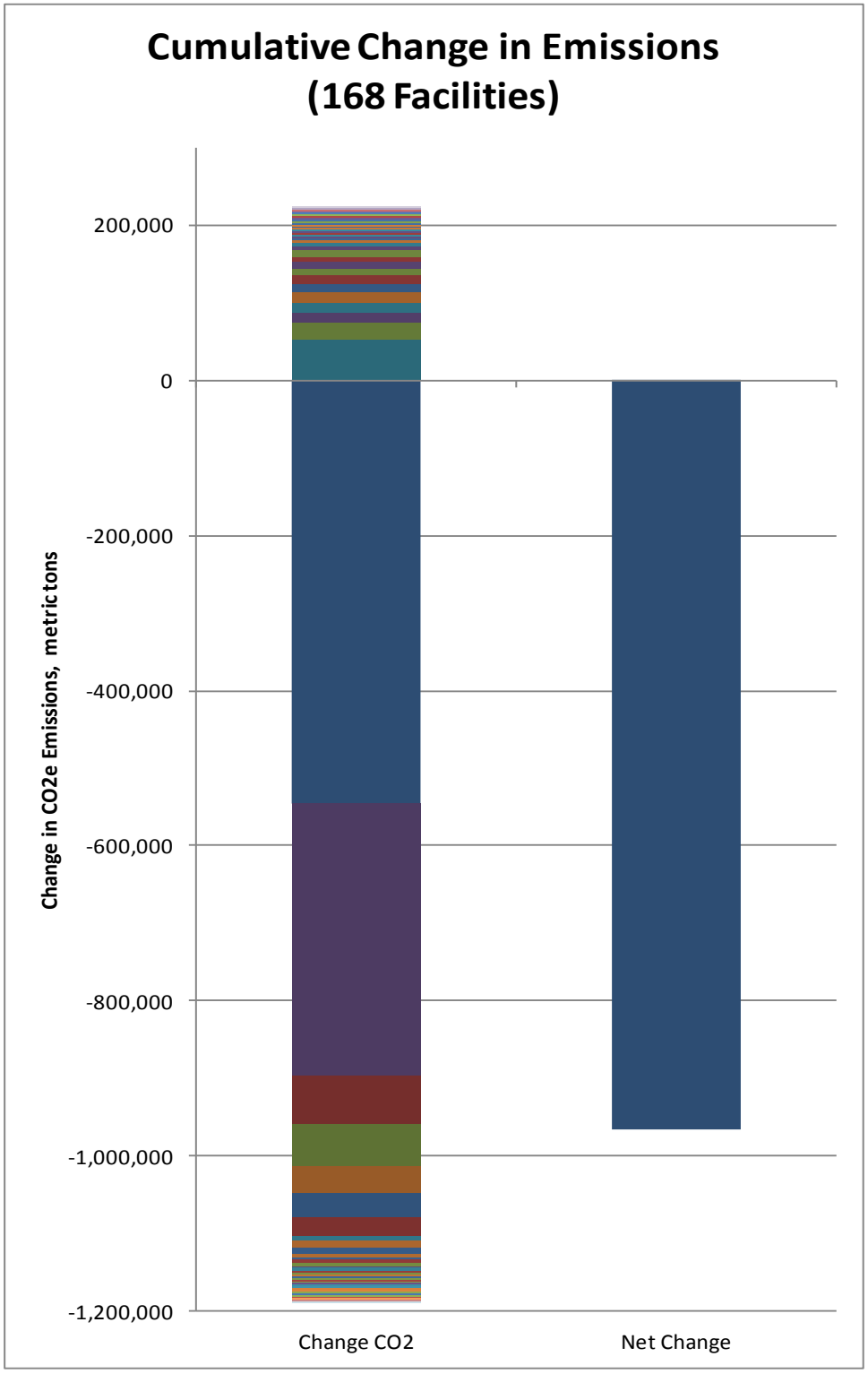

Figure 5: In this figure, each colored segment in the bar on the left represents one facility, and changes are represented as positive or negative depending on whether the verification process resulted in an increase or decrease in reported emissions. Two facilities account for the bulk of the change in reported emissions; the magnitude of most facilities' changes is less than 1,000 metric tons CO_2e (see Figure 4). A total of 1,409,115 metric tons CO_2e were changed during verification, leading to a net change of -965,493 metric tons CO_2e over the three year verification cycle.

Uses of Data in the Registry

The GHG reporting program was developed in compliance with the 2008 Massachusetts Global Warming Solutions Act.[11] As stated in the 2008 Background Information and Technical Support Document for 310 CMR 7.71 (2008 TSD), "Creation of an accurate inventory of statewide GHG emissions will enable effective planning, implementation and tracking of strategies to address the Commonwealth's contribution to climate change." Massachusetts has a history of requiring emissions reporting as a tool to reduce emissions. One example described in the 2008 TSD is the Toxics Use Reduction Act (TURA), which requires companies to track and report their use and disposal of toxic substances. This tracking and reporting contributed to the reduced use of toxics, resulting in financial savings for the companies and improved safety for employees, the public, and the environment. The 2008 TSD also cited similar results for other reporting programs of air pollutants, including reporting based on a pollutant per energy output (tons/megawatt hour).

In the 2008 TSD, MassDEP stated that it believed implementing 310 CMR 7.71: *Mandatory Reporting of GHG Emissions to a Regional Registry* would provide the following benefits to Massachusetts and its sources:

- Establish a GHG emissions inventory for future climate strategies planning
- Establish an emissions baseline and document early action by sources
- Encourage energy efficiency by documenting fuel use at applicable facilities
- Provide information to stakeholders on GHG emissions across the Commonwealth
- Promote readiness for possible new federal reporting regulations
- Reduce the long-term costs of addressing climate change

MassDEP believes that the GHG reporting program is helping to provide some of these benefits, as described below.

By increasing facilities' awareness of their GHG emissions, reporting to the registry has assisted them in identifying opportunities to reduce their emissions. While many facilities indicated that they were already pursuing GHG reductions, some wrote in the survey that reporting emissions helped them identify and measure specific emission sources that had not been targeted before. Total reported GHG emissions have declined steadily from 26.6 million metric tons CO_2e in emissions year 2010 to 20.1 million metric tons in 2012, as shown in Figure 6 below.[12] Most of this decline is caused by decreased utilization of coal at three electric power plants in Massachusetts. Other drivers include substitution of natural gas for oil at smaller facilities and energy savings that result from investments in energy efficiency.

[11] See M.G.L. Chapter 21N, Section 2(a)
[12] See annual Summary Reports at http://www.mass.gov/dep/ghgreporting.

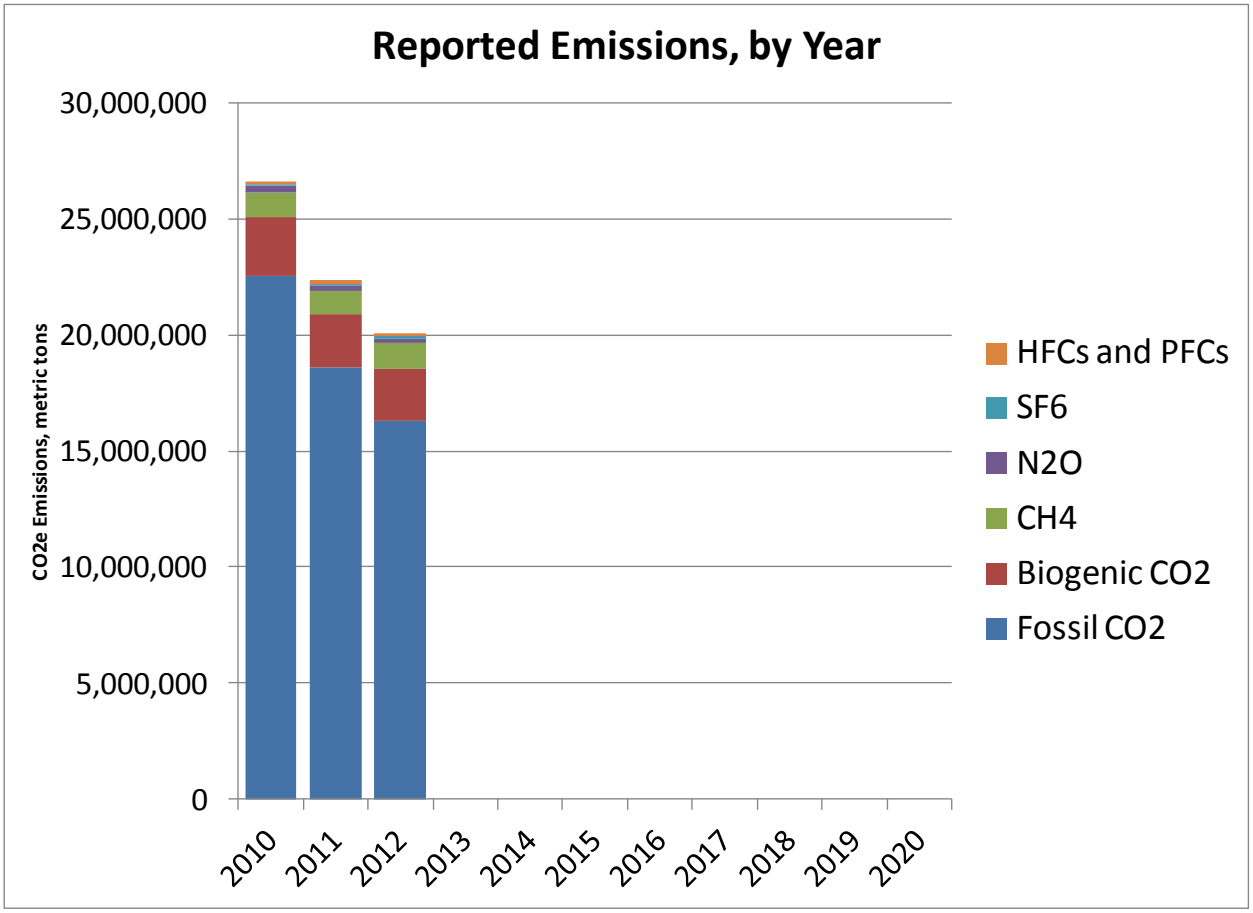

Figure 6: Total GHG emissions reported to the MA GHG registry, by year and gas. The reduction in emissions from year to year is mostly attributable to fuel switching from coal to gas in electricity generating units and from oil to gas in smaller units, as well as efficiency measures.

The record-keeping and reporting practices needed for the GHG reporting program played a role in preparing facilities to meet the requirements of the EPA's Greenhouse Gas Reporting Program which was introduced in 2010 (40 CFR Part 75). Approximately one-third of the facilities which report to the registry also report to EPA, capturing 90-95% of the emissions in Massachusetts, since these are the largest facilities. In the survey, over half of the facilities indicated that they used data collected for the GHG registry for EPA reporting or other purposes such as internal planning and stakeholder engagement.

The information reported to the registry has been useful to MassDEP in multiple respects. For example, some sectors and emissions included in the registry are not covered by other MassDEP reporting programs, such as emissions of fluorinated greenhouse gases that are not reported to the Source Registration program. The Technical Support Document for a recently finalized Massachusetts regulation to control emissions of sulfur hexafluoride (SF_6) from electric distribution equipment describes a specific example: "Another data source that MassDEP reviewed to learn more about SF_6 emissions in Massachusetts is data reported to the MA GHG

Registry, the electronic emissions registry that facilities use to comply with MassDEP's GHG reporting regulation, pursuant to 310 CMR 7.71. This data confirmed the survey results showing that some businesses (e.g. power plants) operate small numbers of GIS [gas-insulated switchgear] that may emit SF_6, and also showed that several electronic manufacturers in Massachusetts each emitted 500 pounds or more of SF_6 in 2010. MassDEP will consider addressing emissions from electronic manufacturers when developing strategies to reduce GHG emissions in the future."[13] Similarly, the GWSA Non-Energy Subcommittee report on supplemental strategies for the Massachusetts Clean Energy and Climate Plan for 2020[14] identifies natural gas distribution networks and the semiconductor manufacturing industry as two potential targets for GHG emissions reductions; emissions from both sectors are documented in the registry. Finally, MassDEP has used the registry to develop an initial understanding of which refrigerant gases are in use in Massachusetts in preparation for developing a regulation to reduce refrigerant leaks and implement a policy described in the Massachusetts Clean Energy and Climate Plan for 2020.[15]

Possessing an ongoing record of GHG emissions by year has potential value for future analysis of longitudinal changes to emissions in Massachusetts. Such analysis could inform future planning and decision-making by MassDEP, providing the data necessary to answer unanticipated questions. The registry can also serve as a future means of establishing an emissions baseline and documenting early action by sources, stated as a goal in the GHG reporting regulation background material.

Conclusion

Over the past three years, third-party verification has met many of its goals to improve the quality of data contained in the registry. In total, 168 facilities made changes to their reports which add up to 1,409,115 metric tons CO_2e, equal to more than 2% of the total amount of emissions reported by facilities over the three year period. While most verifications did not result in significant changes to reported facility emissions, nearly 10% of verifications resulted in changes in excess of 5,000 short tons CO_2e—the applicability threshold for the reporting requirement—and one-third of the facilities that completed verification had changes equal to or greater than the 5% materiality threshold. The costs to facilities, mostly in the $2,500-10,000 range (paid once over the three-year implementation cycle), are consistent with expectations. As MassDEP considers whether the verification requirement should be amended, MassDEP will

[13] See 2013 Background Information and Technical Support Document for: 310 CMR 7.72 Reducing Sulfur Hexafluoride Emissions from Gas-Insulated Switchgear: http://www.mass.gov/eea/agencies/massdep/air/regulations/310-cmr-7-00-air-pollution-control-regulation.html#3
[14] See http://www.mass.gov/eea/docs/eea/gwsa/subcommittee-update-reports-on-2020-plan.pdf
[15] See http://www.mass.gov/eea/agencies/massdep/air/climate/stationary-equipment-refrigerants.html

consider these benefits and costs, other information included in this report, and the following additional relevant information:

1. *Future changes to emissions reports due to verification will likely be smaller.* In 2009, MassDEP suggested that third-party verification would help ensure the most accurate and complete data possible for the registry, as well as improve consistency in reporting across different entities and increasing the likelihood of inclusion of data reported to the registry in future regional, federal, and international programs. By completing third-party verification once for all facilities, MassDEP believes that reporting facilities have learned to improve the quality and consistency of their reporting and will continue to apply lessons learned in the first round of verification to future GHG reports. This conclusion is supported by the significant number of facilities which reported that verification led to changes in methodology for future reporting years.
2. *EPA's federal Greenhouse Gas Reporting Program provides a precedent for verification by a regulatory body.* Approximately one-third of MA GHG reporting facilities also report to the EPA, and their emissions account for 90-95% of the total emissions reported to the registry. Since the Massachusetts verification requirement was designed before EPA's GHG Reporting Program was implemented, MassDEP was not able to anticipate the nature of the federal reporting program. EPA uses an internal verification procedure to ensure data quality, instead of requiring third-party verification. Multiple survey respondents suggested that MassDEP's verification is redundant to EPA's, and suggested greater consistency between the two programs. The GWSA also requires MassDEP to strive for consistency with other state, federal and international GHG reporting programs.[16]
3. *Third-party verification is tied to The Climate Registry reporting platform and protocol*. As explained in the Background section, TCR's voluntary reporting program third-party verification protocol serves as the model for MassDEP's third-party verification process. TCR's contract with MassDEP to support the GHG reporting program expires in June 2016. If the GHG reporting program moves away from the TCR reporting platform and protocol, no clear alternative for a third-party verification process exists.
4. *Third-party verification imposes administrative costs on MassDEP in addition to the cost of funding TCR support.* Managing the current third-party verification process draws on the resources of MassDEP staff, and requires significant involvement from TCR staff funded by the GHG reporting program contract. When the contract between MassDEP and TCR ends, the full burden of administering the verification process will likely rest with MassDEP staff.

Based on the information included in this report, MassDEP is considering amending the verification requirement to eliminate the third-party verification requirement, instead relying on

[16] M.G.L. c. 21N, §2(b)

the existing certification requirement detailed above on page 6. The primary reasons that MassDEP is considering this change are (1) the cost to facilities of third-party verification, (2) the expectation that it may not be possible to rely on TCR's reporting system and protocols in the future, and (3) the likelihood that future changes resulting from verification will be smaller than those discussed in this report. Therefore, MassDEP is particularly interested in comments that provide information which may assist MassDEP in determining whether to eliminate the third-party verification requirement.

Appendix 1: 310 CMR 7.71 (7) – Triennial Verification of Facility Reports

(7) Triennial Verification of Facility Reports.

(a) Entities subject to the requirement to report greenhouse gas emissions from a facility in accordance with 310 CMR 7.71(5) shall employ an approved verification body to verify the greenhouse gas emissions report for that facility once every three years in accordance with the following staggered schedule:

1. Entities that reported greenhouse gas emissions in excess of 25,000 short tons of carbon dioxide that occurred during 2009 from a facility shall employ an approved verification body to verify the 2010 greenhouse gas emissions report for that facility by December 31, 2011, and for every third year thereafter (e.g., the 2013 report shall be verified by December 31, 2014).
2. Entities that were not subject to the verification requirement in 310 CMR 7.71(7)(a)1. for a facility, and that reported greenhouse gas emissions in excess of 10,000 short tons of greenhouse gases in carbon dioxide equivalents that occurred during 2010 for that facility, shall employ an approved verification body to verify the 2011 greenhouse gas emissions report for that facility by December 31, 2012, and for every third year thereafter (e.g., the 2014 report shall be verified by December 31, 2015).
3. Entities that were not subject to the verification requirement in 310 CMR 7.71(7)(a)1. or 2. for a facility, and that reported any greenhouse gas emissions that occurred in 2012 for that facility, shall employ an approved verification body to verify the 2012 greenhouse gas emissions report for that facility by December 31, 2013, and for every third year thereafter (e.g., the 2015 report will be verified by December 31, 2016).
4. Entities that were not subject to the verification requirement in 310 CMR 7.71(7)(a)1., 2., or 3. for a facility, and that reported any greenhouse gas emissions that occurred in any year after 2012 from that facility, shall employ an approved verification body to verify the greenhouse gas emissions report for that facility by December 31 of the calendar year following the calendar year during which the emissions occurred, and for every third year thereafter.
5. In order to establish a common triennial verification schedule for a group of facilities, an entity may choose to employ an approved verification body to verify the greenhouse gas emissions report for any facility in advance of the schedule established for that facility pursuant to 310 CMR 7.71(7)(a). Once a greenhouse gas emissions report for a facility has been verified in advance of the schedule established for that facility pursuant to 310 CMR 7.71(7)(a), any entity that is subject to the requirement to report greenhouse gas emissions from that facility in accordance with 310 CMR 7.71(5) shall employ an approved verification body to verify the greenhouse gas emissions report for that facility for every third year thereafter, and shall not be subject to any other reporting schedule established pursuant to 310 CMR 7.71(7)(a).

(b) Verification shall be demonstrated using a form provided by the Department or the registry. The verification form shall include, but not be limited to, the following:

1. Any information deemed necessary by the Department to identify the reporting facility and the approved verification body.
2. Any information deemed necessary by the Department to ensure that the approved verification body is aware of all relevant provisions of 310 CMR 7.71.
3. The following certification statement: "I certify that I have personally examined the greenhouse gas emissions report for this facility and am familiar with the information contained in that report and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment."
4. The authorized signature and contact information of the approved verification body.

(c) Approved verification bodies may exempt from the verification process emissions from a facility included in a report submitted pursuant to 310 CMR 7.71(5) if said emissions are:

1. carbon dioxide emissions that resulted from combusting either fossil fuels or biogenic fuels, and that were quantified and reported in accordance with 40 CFR Part 75. In the event that emissions quantified and reported in accordance with 40 CFR Part 75 include emissions resulting from the combustion of both biogenic and fossil fuels, said emissions shall be exempt from the verification process only if the biogenic and fossil portions of said emissions are separately quantified in accordance with 40 CFR Part 75;
2. greenhouse gas emissions that have been quantified, reported, and verified in accordance with the offset provisions in 310 CMR 7.70(10), or corresponding provisions in the CO_2 Budget Trading Program regulations of any other state; or,
3. greenhouse gas emissions that have been voluntarily reported to The Climate Registry, verified in accordance with the *General Verification Protocol*, and made publically available by The Climate Registry.

(d) The Department may require the entity that reported greenhouse gas emissions from a facility, or the approved verification body that verified an emissions report, to explicitly identify any emissions that have been exempted from the verification process pursuant to 310 CMR 7.71(7)(c).

(e) Verification shall be in accordance with all applicable requirements of the *General Verification Protocol*. Notwithstanding any references to a reporting "entity" in the *General Reporting Protocol* or the *General Verification Protocol*, a facility subject to the requirement to report greenhouse gas emissions in accordance with 310 CMR 7.71(5) shall be considered to constitute a complete reporting entity for the purpose of reporting greenhouse gas emissions in accordance with 310 CMR 7.71(5).

(f) Verification by an approved verification body shall be at the expense of the entity reporting greenhouse gas emissions in accordance with 310 CMR 7.71(5).

(g) In the event that errors in a certified greenhouse gas report are discovered during the verification process, the reporting entity shall correct said errors and any corresponding errors in the previous two annual reports, and shall re-certify said reports.

(h) **Not later than December 31, 2014, the Department shall complete a review, including an opportunity for public comment, of the verification requirement established pursuant to 310 CMR 7.71(7). This review shall evaluate the costs of verification to facilities, the quality and uses of the data in the registry, and any other information relevant to determining whether the verification requirement should be amended.** ” (*emphasis added*)

Appendix 2: Verification Cost Survey for Reporting Facilities and Results

Date: February 25, 2014

Subject: MassDEP GHG Verification Review Facility Survey

Dear Massachusetts GHG Reporters,

You are invited to complete the online Verification Review Facility Survey. The survey will be available online at the address below until March 14th.

As you know, the GHG reporting program includes a mandatory third-party verification component (see 301 CMR 7.71(7)). By the end of 2013, all facilities should have completed third-party verification for one emissions year, depending on the magnitude of emissions reported in each year. The regulation includes a provision stating that "no later than December 31, 2014, the Department shall complete a review, including an opportunity for public comment, of the verification requirement established pursuant to 310 CMR 7.71(7). This review shall evaluate the costs of verification to facilities, the quality and uses of the data in the registry, and any other information relevant to determining whether the verification requirement should be amended." As part of this review, we are soliciting information from reporting facilities to gain a better understanding of the costs and benefits of the verification process.

Please complete the short online Verification Review Facility Survey to provide information about the verification process for your facility. Completion of the survey is optional, and you do not need to answer each question. However, we encourage you to provide as much information as possible. In particular, information about verification costs and benefits will help MassDEP to determine whether program revisions are appropriate. Note that, to ensure the reliability of submitted data, MassDEP is not accepting anonymous surveys; you must provide the name of your facility to complete the survey.

Please be advised that all records submitted to MassDEP, except those listed at 310 CMR 3.10 Availability of Public Records to the General Public, are public records. Survey participants who wish to request that certain documents or records be kept as confidential business information may choose to comply with requirements described at http://www.mass.gov/eea/agencies/massdep/service/approvals/requests-to-maintain-trade-secret-info-confidental.html.

The survey is available at **https://www.surveymonkey.com/s/MassDEPVerification**, and should only take a few minutes. Note that this email has been sent to all registered users of the

MA GHG Registry. Please coordinate within your organization so that the survey is only completed once for each facility. If you have any questions, please contact Seth Federspiel at 617-292-5805 or Seth.Federspiel@state.ma.us.

Thank you in advance for your assistance in this review process.

Christine Kirby

Director, Division of Air and Climate Programs
MassDEP
One Winter Street, Boston, MA 02108
617-292-5631
christine.kirby@state.ma.us

Questions (to be formatted as appropriate for survey platform)

1. Facility name:
2. Contact person for survey:
3. Emissions year verified: (2010, 2011, 2012)
4. Total GHG emissions reported in emissions year verified (short tons CO_2e):
5. Total cost of verification to facility (amount paid to verification body):
    a. $0-$2,500
    b. $2,501-$5,000
    c. $5,001-$10,000
    d. $10,001-$15,000
    e. $15,001-$25,000
    f. Greater than $25,000
6. Did the verification process lead to changes in your GHG report for the year being verified? (yes/no)
7. If so, were the changes greater than 5% of the total emissions reported? (yes/no; % change:__)
8. Did the verification process lead to changes in your GHG report for the years prior to the one being verified? (yes/no)
9. Did the verification process lead to changes in the methodology of your GHG reporting for years following being verified? (yes/no/NA)
10. Overall, do you feel that the verification process improved the quality of the data in your GHG report(s)? (yes/no)
    a. Why or why not:
11. Overall, do you feel that the verification process was worth the cost? (yes/no)

    a. Why or why not:
12. Please share any additional feedback regarding the verification process:
13. Considering the GHG reporting program as a whole, has the GHG reporting process and data reported for your facility resulted in your facility considering or implementing measures to reduce GHG emissions (for example by identifying large GHG emissions sources)? (yes/no; explain)
14. Do you use the data collected through the GHG reporting program for any other purposes, such as providing information to EPA according to 40 CFR Part 98 or to other stakeholders? (yes/no; explain)

Verification Survey Results

								Question 4: Emissions (short tons)		Question 6: Changes due to verification?	
Group	**# Respondents**	**EY 2010**	**EY 2011**	**EY 2012**				**Average**	**Median**	**Yes**	**No**
All	69	1%	28%	49%				105,686	19,717	42%	58%
$0-2,500	1	100%	0%	0%				not reported	not reported	100%	0%
$2,501-5,000	19	21%	16%	63%				63,852	15,880	35%	65%
$5,001-10,000	33	46%	27%	27%				148,236	14,166	58%	42%
$10,001-15,000	4	25%	50%	25%				85,730	68,183	0%	100%
$15,001-25,000	8	12%	88%	0%				77,903	23,357	0%	100%
$25,000 +	2	50%	0%	50%				28,910	28,910	50%	50%
		$0-2,500	**$2,501-5,000**	**$5,001-10,000**	**$10,001-15,000**	**$15,001-25,000**	**>$25,000**				
All Years	69	1%	28%	49%	6%	12%	3%	105,686	19,717	42%	58%
2010	23	4%	17%	67%	4%	4%	4%	233,573	114,029	56%	44%
2011	22	0%	14%	43%	10%	33%	0%	57,420	15,772	18%	82%
2012	24	0%	52%	39%	4%	0%	4%	5,691	5,030	52%	48%

(continued)

	Question 7: Changes 5% or greater?		Question 8: Changes to prior years?		Question 9: Changes to future methods?		Question 10: Improved data quality?		Question 11: Worth cost?		Question 13: GHG reductions?		Question 14: Other Uses?	
Group	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
All	12%	88%	4%	96%	39%	61%	26%	74%	18%	82%	25%	75%	56%	44%
$0-2,500	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	0%	100%	100%	0%
$2,501-5,000	0%	100%	0%	100%	39%	61%	26%	74%	6%	94%	24%	76%	33%	67%
$5,001-10,000	17%	83%	6%	94%	50%	50%	31%	69%	24%	76%	29%	71%	56%	44%
$10,001-15,000	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	25%	75%	50%	50%
$15,001-25,000	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	12%	88%	88%	12%
$25,000 +	0%	100%	0%	100%	50%	50%	50%	50%	50%	50%	0%	100%	100%	0%
All Years	12%	88%	4%	96%	39%	61%	26%	74%	18%	82%	25%	75%	56%	44%
2010	6%	94%	4%	96%	45%	55%	23%	77%	22%	78%	36%	64%	70%	30%
2011	33%	67%	9%	91%	27%	73%	14%	86%	14%	86%	19%	81%	68%	32%
2012	6%	94%	0%	100%	44%	56%	42%	58%	17%	83%	18%	82%	26%	74%

Appendix 3: Analysis of Verification Impacts on Reported Data

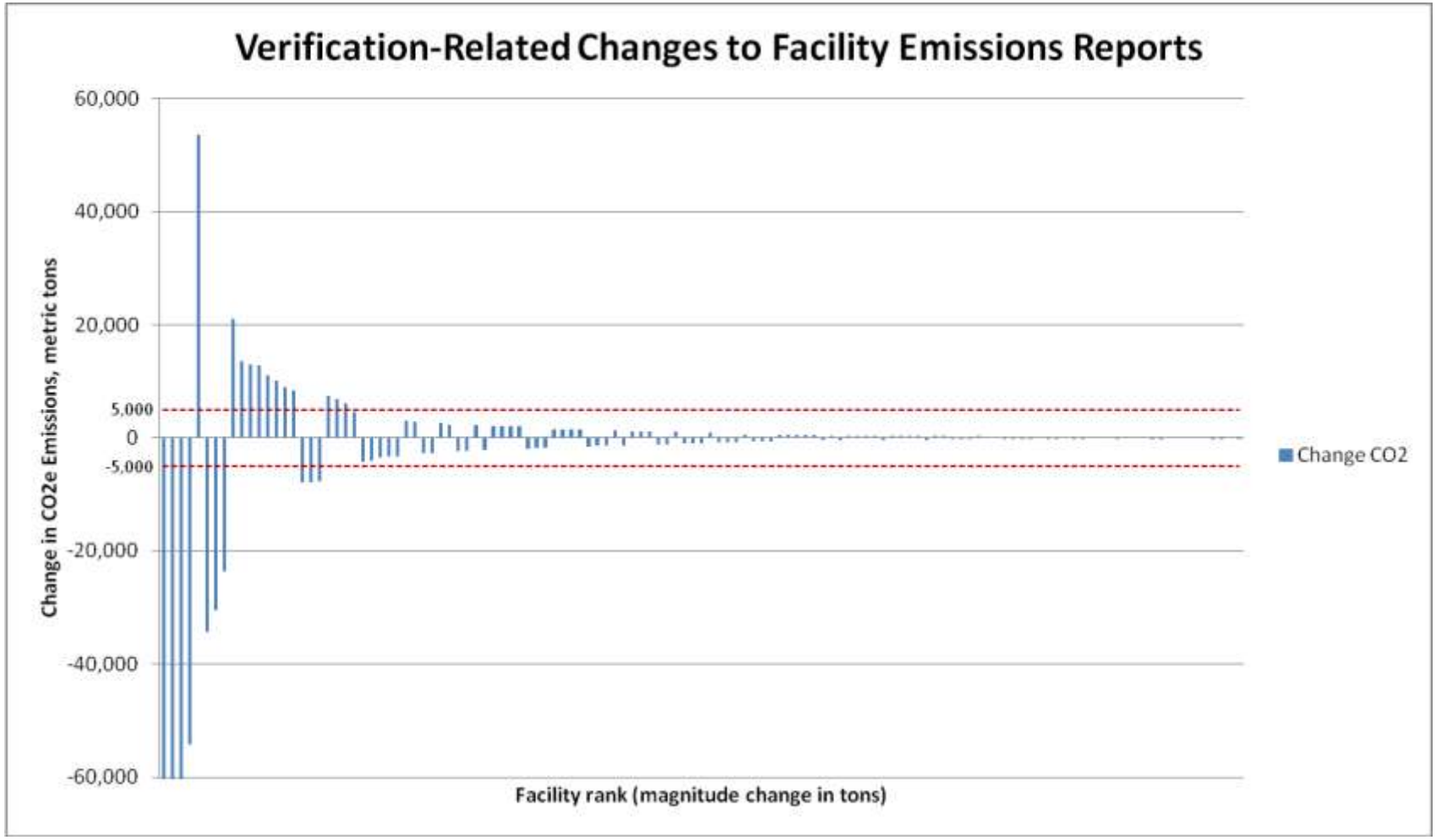

Figure 7: This graph shows the changes made to each facility's report due to verification in metric tons CO_2e, in order from greatest to least absolute value. Each bar represents one facility, and corresponds to the bar in the same location in the change in percent graphed in Figure 5. Note that the first three facilities' changes exceed the axis value; #1 is -545,630 metric tons CO_2e, #2 is -349,747 metric tons CO_2e, and #3 is -64,775 metric tons CO_2e. Most facilities' reports changed less than +/- 1,000 metric tons CO_2e or not at all. (Unchanged reports are not shown on the graph.)

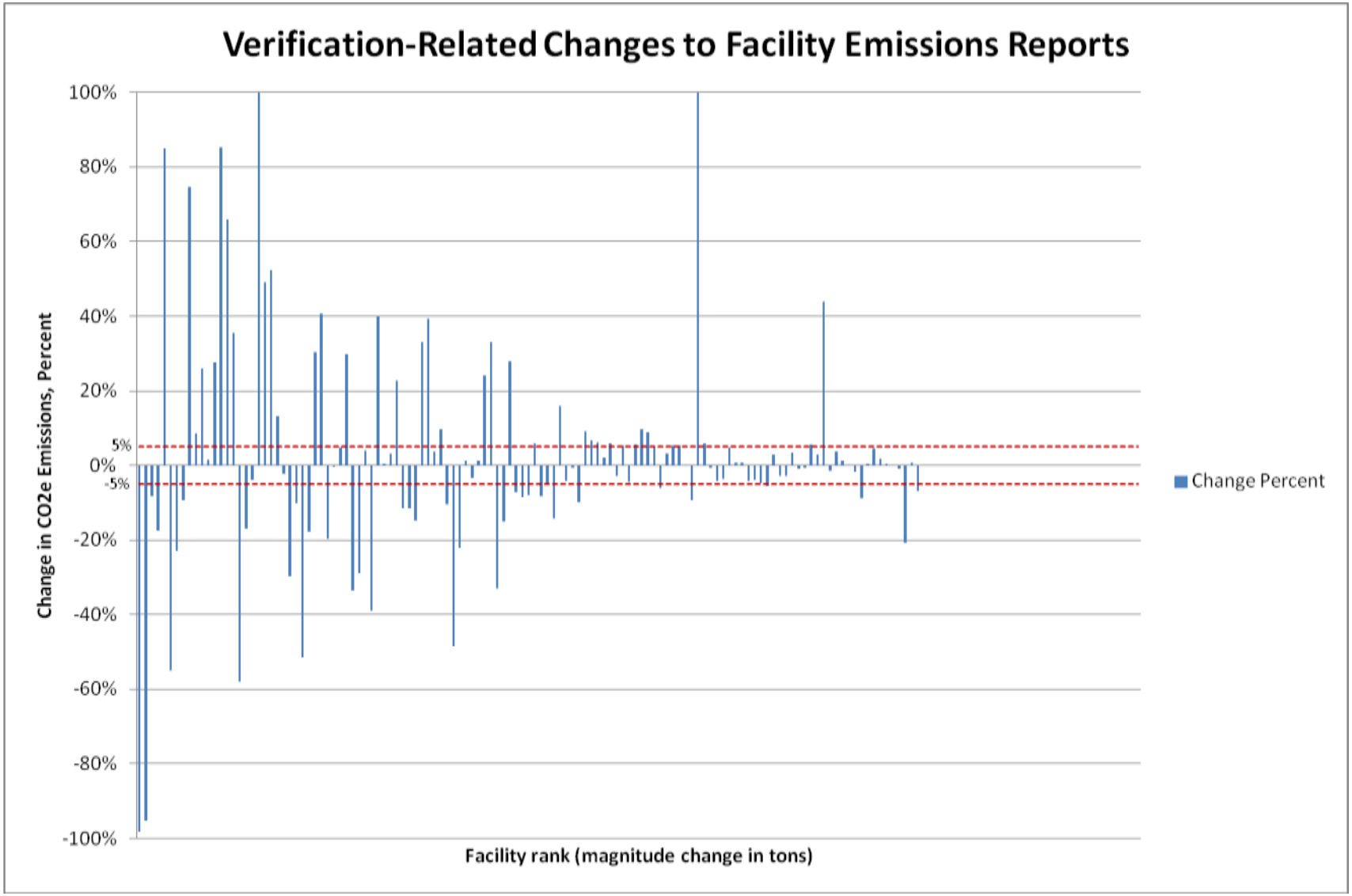

Figure 8: This graph shows the changes made to each facility's report due to verification in percent, in order from greatest to least absolute value of change in metric tons. Each bar represents one facility, and corresponds to the bar in the same location in the change in tons graphed in Figure 4. Note that two facilities' changes exceeded the axis value of 100%; #21 is 2,739% and #91 is 307%.